WHAT IS CLAIMED IS:

1. An inductive element comprising:

a plurality of U-shaped conductors which are constituted by cutting conductors of a stacked layer member in U-shapes;

a plurality of insulating layer interposed between the U-shaped conductors;

an embedding material filled in a groove formed by cutting said conductor of the stacked layer member; and

a bridge conductor which bridges an opening edge of the U-shaped conductor to an opening edge of the next U-shaped conductor to form a coil.

2. An inductive element as claimed in claim 1 wherein said U-shaped conductors are connected by said bridge conductor by skipping one of said U-shaped conductors so as to form two sets of rectangular helical coils.

3. An inductive element as claimed in claim 1 wherein either said insulating layer or said embedding material is made of either resin or a composite material which is made by mixing functional material powder into the resin.

4. An inductive element as claimed in claim 1 wherein said U-shaped conductor is made of either a metal plate or a metal foil; and said bridge conductor is formed by a photolithography method.

5. An inductive element as claimed in claim 4 wherein said bridge conductor is formed on a flattened surface of both an opening edge of said U-shaped conductor said embedding material which has been embedded in said groove.

6. An inductive element as claimed in claim 1 wherein said inductive element has an insulating layer which covers a peripheral portion of said coil; at least one of said insulating layer and said embedding material is constructed of a magnetic material; and the insulating layer between the coil conductors is made of a dielectric material.

7. A manufacturing method of an inductive element comprising the steps of:

preparing a rectangular plate-shaped base material which contains a number of conductor layers corresponding to a turn number of plural inductive elements within a width along a stacking layer direction, while the conductor layers and insulating layers are alternately stacked, said rectangular plate-shaped base material owns a thickness equivalent to one piece of said inductive element;

forming a plurality of grooves having a predetermined width in surfaces of said base material in such a manner that said plural grooves are positioned parallel to each other along the stacking layer direction so as to form a coil inner peripheral portion;

filling embedding materials into said grooves;

flattening the surfaces of said base material into which said embedding materials have been embedded;

forming bridge conductors by way of a photolithography method, and are connected between adjoining conductor layers in such a manner that said bridge conductors bridge over said embedding materials on the matched plane so as to constitute rectangular helical coils which constitute the inductive elements;

covering both the front plane and the rear plane of said base material to which said bridge conductors have been applied by an insulating material;

forming external terminals corresponding to the respective rectangular helical coils on said front plane; and

cutting said base material along longitudinal and lateral directions, whereby chips which constitute the respective inductive elements are obtained.

8. A manufacturing method of an inductive element as claimed in claim 7 wherein slits are formed among the grooves into which said embedding materials have been embedded before said cutting process operation is carried out, and insulating materials are filled into the respective slits; and

portions of the respective filled insulating materials are cut by a cutting means which is narrower than a width of said insulating material.

9. A manufacturing method of an inductive element as

claimed in claim 8 wherein both the front plane and the rear plane of said base material are covered by an insulating material, and at the same time, the insulating material is filled into said slits.

10. A manufacturing method of an inductive element as claimed in claim 7 wherein an insulating material is coated on either a band-shaped metal plate or a band-shaped metal foil, which has a width corresponding to said plurality of inductive elements and constitutes said conductor layer;

said coated band-shaped base material is cut in a width corresponding to said plurality of inductive elements so as to obtain seat-shaped base materials;

a plurality of said seat-shaped base materials are stacked so as to be formed in an integral form, which own a conductor layer number equivalent to a turn number of said plural inductive elements; and

said integrally-formed stacked layer member is cut along a stacking layer direction at a width corresponding to a thickness of one piece of said inductive element, whereby said base material is obtained.

11. A manufacturing method of an inductive element as claimed in claim 10 wherein in the case that either said metal plates or said metal foils are stacked to which said insulating material has been coated, while such band-shaped base materials having a thickness equivalent to the conductor layer number

as to one piece of the inductive element are defined as one set, an insulating layer having a thickness thicker than the thickness of the insulating layer between the conductor layers is interposed between one set of the band-shaped base materials so as to be formed in an integral form.

12. A manufacturing method of an inductive element as claimed in claim 7 wherein: in the case that said helical coils are formed, the bridge conductors are connected by skipping one of said bridge conductors with respect to the U-shaped conductor so as to form two pieces of said helical coils per a single chip.

13. An inductive element comprising:

a stacked core substrate formed by stacking a plurality of core substrates, each core substrate having U-shaped conductor corresponding to three sides of plural rectangular helical coils;

a bridge conductor which bridges an opening edge of the U-shaped conductor to an opening edge of the next U-shaped conductor to form a coil;

an insulating layer covering said bridge conductors.

14. An inductive element as claimed in claim 13 wherein said U-shaped conductors are connected by said bridge conductor by skipping one of said U-shaped conductors so as to form two sets of rectangular helical coils.

15. An inductive element as claimed in claim 13 wherein said U-shaped conductors of each of said layers are coaxially formed in a multiple manner; such U-shaped conductors having the same sizes, which are located adjacent to each other along a stacking layer direction, are connected to each other by said bridge conductors; and among the U-shaped conductors which are located adjacent to each other along inner/outer directions, such U-shaped conductors located on the same side edge portions along the stacking larger direction, or the opposite side edge portions along the stacking layer direction are connected to each other by said bridge conductors, whereby rectangular helical coils are formed in a multiple manner.

16. An inductive element as claimed in claim 13 wherein both said insulating member and said insulating layer are made of either resin or a composite material made by mixing functional material powder into the resin.

17. An inductive element as claimed in claim 13 wherein both said U-shaped conductors and said bridge conductors are formed by way of a photolithography method.

18. A manufacturing method of an inductive element comprising the steps of:

forming a plurality of U-shaped conductors corresponding to three sides of plural rectangular helical coils on surfaces

of a core substrate in such a manner that opening edges of said U-shaped conductors are arrayed along longitudinal and lateral directions so as to be directed to the same direction;

stacking plural sheets of said core substrates to be formed in an integral form so as to constitute a stacked core substrate;

cutting said stacked core substrate in such a manner that said opening edges of said U-shaped conductors are exposed;

forming bridge conductors for connecting said opening edges to each other by way of a photolithography method on a cutting plane where said opening edges of said U-shaped conductors are exposed so as to form the rectangular helical coils;

forming an insulating layer for covering said bridge conductors on the cutting plane on which said bridging conductors have been formed; and

cutting said base material into respective chips so as to obtain the inductive elements.

19. A manufacturing method of an inductive element as claimed in claim 18 wherein after a stick-shaped base material in which U-shaped conductors equivalent to plural pieces of said inductive elements are built is obtained by cutting said stacked core substrate in such a manner that the opening edges of said coil conductors are exposed, forming operation of said bridge conductors are carried out.

20. A manufacturing method of an inductive element as claimed in claim 18 wherein in the case that said core substrate is stacked, such core substrates having turn numbers equivalent to a thickness of said plural pieces of inductive elements are stacked to be formed in an integral form;

after a plate-shaped base material in which the U-shaped conductors having such a width along the stacking layer direction, corresponding to plural pieces of said inductive elements, have been built is obtained by cutting said stacked core substrate in such a manner that the opening edges of said coil conductors are exposed, forming operation of said bridge conductors is carried out.

21. A manufacturing method of an inductive element as claimed in claim 18 wherein conductor layers which constitute both edge plane portions of terminal electrodes of the inductive elements are provided on both edge planes of said stacked core substrate along a stacking layer direction.

22. A manufacturing method of an inductive element as claimed in claim 20 wherein the conductor layers which constitute both said edge plane portions of the terminal electrodes of the inductive elements are provided on both the edge planes of said stacked core substrate along the stacking layer direction, and also, a portion which constitutes a boundary between the inductive elements.

23. A manufacturing method of an inductive element as

claimed in claim 18 wherein when said stacked core substrate is cut, the cutting operation is carried out in such a manner that insulating layers are simultaneously formed around the three sides of the U-shaped conductors.

24. A manufacturing method of an inductive element as claimed in claim 18 wherein instead of the core substrate on which the U-shaped conductors have been formed, such a core substrate on which plural columns of ladder-shaped conductors have been formed is employed as said core substrate; and

said stacked core substrate is cut along a direction perpendicular to a longitudinal direction of the ladder-shaped conductors, whereby substantially U-shaped conductors are obtained.

25. A manufacturing method of an inductive element as claimed in claim 18 wherein in the case that said helical coils are formed, the bridge conductors are connected by skipping one of said bridge conductors with respect to the U-shaped conductor so as to form two pieces of said helical coils per a single chip.

26. A manufacturing method of an inductive element as claimed in claim 18 wherein the U-shaped conductors are coaxially formed on each of said core substrate in a multiple manner; and

the multiple rectangular helical coils are formed by

that in a cutting plane where the opening edges of said U-shaped conductors of said stacked core substrate, such U-shaped conductors having the same sizes and located adjacent to each other along the stacking layer direction are connected by said bridge conductors; and also, such U-shaped conductors provided at edge portions among the U-shaped conductors which are located adjacent to each other along inner/outer directions are connected by the bridge conductors.